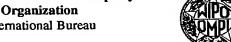
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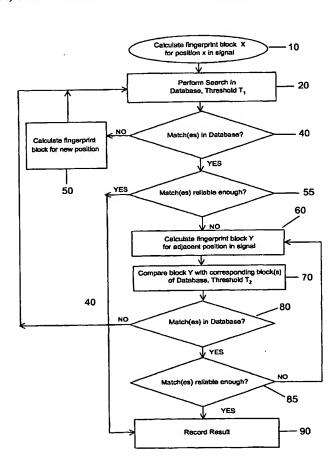
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[Continued on next page]

(54) Title: IMPROVED AUDIO DATA FINGERPRINT SEARCHING



(57) Abstract: Methods and apparatus are described for matching a set input fingerprint blocks, each fingerprint block representing at least a part of an information signal, with fingerprints stored in a database that identify respective information signals. The method includes selecting a first fingerprint block of the set of input fingerprint blocks (10), and finding at least one fingerprint block in the database that matches the selected fingerprint block (20, 40). A further fingerprint block is then selected from the set of input blocks (60), at a predetermined position from the first selected fingerprint block. A corresponding fingerprint block is then located in the database at the same predetermined position relative to the found fingerprint block (70), and it is determined if the located fingerprint block matches the selected further fingerprint block (80).



#### Declaration under Rule 4.17:

— as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE,

DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)

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According to International Patent Classification (IPC) or to both national classification and IPC

### B. FIELDS SEARCHED

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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, INSPEC

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
x	WO 02 11123 A (SHAZAM ENTERTAINMENT LTD; SMITH JULIUS O III (US); WANG AVERY LI C) 7 February 2002 (2002-02-07) abstract page 4, line 29 -page 5, line 8 page 13, line 14 -page 13, line 32 page 19, line 5 -page 29, line 2	1-14
X	HAITSMA ET AL: "Robust Audio Hashing for Content Identification" PROCEEDINGS INTERNATIONAL WORKSHOP ON CONTENT-BASED MULTIMEDIA INDEXING, XX, XX, 19 September 2001 (2001-09-19), pages 1-8, XP002198245 the whole document /	1-14

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NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Abbing, R

# INTERNATIONAL SEARCH REPORT

PCT/13/04404

		101710-3704404
	ation) DOCUMENTS CONSIDERED TO BE RELEVANT  Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Category °	Citation of document, with indication, where appropriate, or the resevant passages	
X	OOSTVEEN J ET AL: "FEATURE EXTRACTION AND A DATABASE STRATEGY FOR VIDEO FINGERPRINTING" LECTURE NOTES IN COMPUTER SCIENCE, SPRINGER VERLAG, NEW YORK, NY, US, vol. 2314, 11 March 2002 (2002-03-11), pages 117-128, XP009017770 ISSN: 0302-9743 the whole document	1-14
Α	WELSH,M., BORISOV,N.,HILL,J.,VON BEHNEN, R, WOO, A.: "Querying large collections of music for similarity" TECHNICAL REPORT UCB/CSD00-1096, 'Online! November 1999 (1999-11), pages 1-13, XP002275121 Berkeley, U.S.A. Retrieved from the Internet: <url:http: citeseer.ist.psu.edu="" welsh99querying.html=""> 'retrieved on 2004-03-25! abstract page 2, paragraph 2 page 7, paragraph 4.1</url:http:>	1-14
A	KURTH,F., CLAUSEN, M.: "Full-text Indexing of Very Large audio Data Bases" AUDIO ENGINEERING SOCIETY CONVENTION, 'Online! 12 - 15 May 2001, pages 1-11, XP002275122  Amsterdam, The Netherlands Retrieved from the Internet: <url:www.cg.cs.tu-bs.de aes110pcmindex.pdf="" pubs.collection="" v3d2=""> 'retrieved on 2004-03-25! the whole document</url:www.cg.cs.tu-bs.de>	1-14
A	CANO,P.,BATLLE,E.,MAYER,H.,NEUSCHMID,H.: "Robust Sound Modeling for Song detection in Broadcast Audio" AUDIO ENGINEERING SOCIETY CONVENTION, 'Online! 10 May 2002 (2002-05-10) - 13 May 2003 (2003-05-13), pages 1-7, XP002275123 Munich, Germany Retrieved from the Internet: <url:www.iua.upf.es 02-pcano.pdf="" aes20="" mtg="" publications=""> 'retrieved on 2004-03-25! page 5, left &amp; right hand column, "Approximate Matching"</url:www.iua.upf.es>	1-14

## INTERNATIONAL SEARCH REPORT

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Patent document cited in search report		Publication date		Patent family member(s)	Publication date
WO 0211123	A	07-02-2002	US AU BR WO EP JP	2002083060 A1 8976601 A 0112901 A 0211123 A2 1307833 A2 2004505328 T	27-06-2002 13-02-2002 10-06-2003 07-02-2002 07-05-2003 19-02-2004